

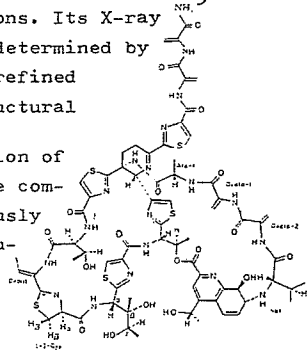
03. CRYSTALLOGRAPHY IN BIOCHEMISTRY AND PHARMACOLOGY

C-75

03.3-18 HIGHLY OXIDIZED PEPTIDIC ANTIBIOTIC: CRYSTAL CONFORMATION OF SIOMYCIN-A. By C. Pascard and T. Prangé, Institut de Chimie des Substances Naturelles, CNRS, 91190 Gif sur Yvette, France.

Siomycin-A (mw=1486) is a cysteine-containing polycyclic polypeptide, largely modified by dehydrogenation. It differs from its parent thiostrepton (Anderson et al., Nature (1970), 225, 233) by three peptide units included in a lateral macrocycle. It crystallizes in large tetragonal crystals from a MeOH/CHCl₃ solution in precise proportions. Its X-ray structure has been determined by direct methods and refined using 4620 obs. structural factors.

The conformation of the backbone will be compared to the previously reported n.m.r. results in solution (Tori et al., J. Antibiot. (1979), 32, 1072), and to the nosiheptide structure (Prangé et al. Nature (1977) 265, 189).



03.3-19 THE CRYSTAL AND MOLECULAR STRUCTURE OF THE TERNARY COMPLEXES WITH IONOPHORE ANTIBIOTICS, Rb⁺ CATION AND UNCOUPLER. By Y. Nishibata, A. Itai and Y. Iitaka, Faculty of Pharmaceutical Sciences, University of Tokyo, Hongo, Tokyo, Japan, and Y. Nawata, Chugai Pharmaceutical Co. Ltd., Takada, Tokyo, Japan.

Proton uptake and the release of K⁺ cations from liposomes containing potassium phosphate were catalyzed by the uncoupler 3,5-di-*t*-butyl-4-hydroxybenzylidenemalononitrile (hereafter abbreviated as SFH) in the presence of valinomycin, and the formation of the ternary complex K⁺.valinomycin.SF⁻ (I) in the liposomal membrane was suggested (A. Yamaguchi & Y. Anraku, Biochem. Biophys. Acta, 501, 150, 1978).

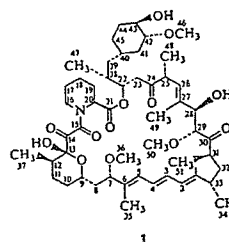
We succeeded in obtaining the crystals of (I) as well as Rb⁺.valinomycin.SF⁻ (II) and Rb⁺.tetranactin. SF⁻ (III). Crystal structures of the latter two were solved by the heavy-atom method. R indices of 0.17 and 0.08 were obtained for (II) and (III), respectively. Structures of the complexed cations in (II) and (III) are very similar to those observed in valinomycin-KI₂ (K. Neupert-Laves & M. Dobler, Helv. Chim. Acta, 58, 432, 1975) and tetranactin-KSCN (T. Sakamaki, et al., Acta Cryst., B32, 768, 1976). In the crystals of (II) and (III), Rb⁺-ionophore complexes and SF⁻ anions are piled up alternatively, forming columns. *t*-Butyl groups of SF⁻ approach the cavities of Rb⁺-valinomycin complexes, although malononitrile groups of SF⁻ are near to the surface of Rb⁺-tetranactin complexes. In both cases, non-bonded interactions between Rb⁺-ionophore and SF⁻ anions are predominant.

03.3-20 X-RAY CRYSTALLOGRAPHIC AND NMR STUDIES ON BARIUM-VALINOMYCIN COMPLEXES. By S. Devarajan, C.M.K. Nair, K.R.K. Easwaran and M. Vijayan, Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560012, India.

As part of a programme of crystallographic and spectroscopic studies aimed at exploring the conformational possibilities of ionophores, the crystal structures of 1:2 complexes of valinomycin with barium perchlorate and barium thiocyanate have been determined. A preliminary account of the X-ray analysis of the perchlorate complex has already been published (Nature (1980) 286, 640-641). The structure, including 15 solvent atoms, has subsequently been refined to an R of 0.109 for 3504 observed reflections. The valinomycin molecule in the structure has an unusual hitherto unnoticed conformation in which the extended depsi-peptide chain, with no internal hydrogen bond, is wound in the form of an ellipse. The barium ions are located approximately at the foci. The crystal structure of the barium thiocyanate complex, analysed later and refined to an R of 0.125 for 2237 observed reflections, is not isomorphous to the corresponding perchlorate complex. The overall molecular conformation and the pattern of metal coordination in the two complexes are, however, similar although significant differences exist in details. The structure analysis of the two complexes thus establishes the possibility of a novel conformation, without internal hydrogen bonds, for valinomycin. Proton NMR studies in solution, especially those using nitroxide free radicals, also indicate the absence of internal hydrogen bonds in the complex.

03.3-21 THE STRUCTURE OF THE ANTIFUNGAL ANTIBIOTIC RAPAMYCIN. Peter S. White and D. C. Neil Swindells, Department of Chemistry, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6E2.

Rapamycin, C₅₁H₇₉NO₁₃, has been shown effective against *Candida albicans* whilst having no activity against the bacteria which normally suppress the emergence of candidiasis. Crystalline rapamycin is orthorhombic, space group P2₁2₁2₁, *a* = 34.866(9), *b* = 13.069(5), *c* = 12.262(7) Å. Data were collected on a Picker FACS-I diffractometer using CuKα radiation (λ = 1.5418 Å) for 2θ ≤ 120° resulting in 4638 reflections of which 3737 were considered observed (*I* > 3σ(*I*)). Initial attempts to solve the structure by direct methods (MULTAN) failed. However, the inclusion of some structural information from ¹³C nmr in the normalisation of the structure factors lead to a number of recognisable fragments (32 atoms) in the E-map. A series of fourier syntheses then yielded the full structure



C-76

03. CRYSTALLOGRAPHY IN BIOCHEMISTRY AND PHARMACOLOGY

and after several cycles of least squares refinement the locations of the hydrogens were established by a difference synthesis. The final R value was 0.068 for the observed reflections.

The structure consists of a 31-membered macrolide ring with an oxygen bridge between C(9) and C(13). The absolute configuration as shown in the figure was ascertained (J. A. Findlay and L. Radics, Can. J. Chem. 58, 579-590, 1980) by isolating L(-)-pipecolic acid from hydrolysis products.

03.4-02 CHOLESTERYL ESTERS: CRYSTAL AND LIQUID CRYSTALLINE STRUCTURES. Patricia Sawzik and B. M. Craven, Department of Crystallography, University of Pittsburgh, Pittsburgh, PA 15260 USA.

A series of X-ray crystal structure determinations of cholesteryl n-alkanoate ($n=2, 6, 8-12, 14$) and n-alkenoate ($n=16:1^{A9}, 18:1^{A9}$) esters has been undertaken, one aim being to seek features which may be relevant to molecular association in the less ordered liquid crystalline phases. The saturated cholesteryl esters with chain length C_6-C_{18} and the unsaturated palmitoleate and oleate have one of three crystal structure types as the most stable form at room temperature. These crystal structure types are designated as monolayers II (ester chain length C_6-C_9 , $C_{18:1}^{A7}$), monolayers I (C_9-C_{12} , $C_{16:1}^{A9}$) and bilayers ($C_{13}-C_{18}$) with cholesteryl-cholesteryl, cholesteryl-alkyl, and alkyl-alkyl interactions becoming successively dominant. The X-ray diffraction patterns for the smectic phase of the cholesteryl esters suggest a relationship with the monolayer type I crystal structures. Diffracted orders from the crystal monolayers ($l = 2$ through 5) are very weak. The strong first order has a d-spacing similar to that of the single sharp intense inner diffraction ring of the smectic phase. X-ray diffraction patterns for the cholesteric and smectic phases are similar but in the cholesteric the inner ring is more diffuse. This may be due to a short range ordering of antiparallel pairs of molecules as found in the bilayer crystal structures.

Work supported by NIH Grant HL-20350.

03.4-01 PHASE TRANSITION AND 37°C CRYSTAL STRUCTURE OF CHOLESTEROL. Leh-Yeh Hsu and C. E. Nordman, Department of Chemistry, University of Michigan, Ann Arbor, MI 48109, U.S.A.

The unit cell of cholesterol ($C_{27}H_{46}O$) above the 31.6°C phase transition (Petrovavlov & Kostin, Kristallografiya (1976) 21, 168) is triclinic, space group P1, with $a = 27.565$, $b = 35.776$, $c = 10.748$, $\alpha = 94.45^\circ$, $\beta = 90.90^\circ$, $\gamma = 73.87^\circ$, at 37°C. There are 16 independent molecules, compared to 8 in the room temperature (RT) cell (Shieh et al., Nature (1977) 267, 287; Acta Cryst., in press). A restrained-group Gauss-Seidel (FGLS) refinement procedure (Hoard & Nordman, Acta Cryst. (1979) A35, 1010) was used to deduce a refinable structure from the RT starting model. A combination of FGLS and anisotropic block-diagonal refinement presently gives $R = 0.09$ for 18,047 reflections. The bilayer structure of hydrogen-bonded chains of molecules bears an overall resemblance to the RT phase, differing from the latter in that several molecules have turned about their long axes by varying amounts, up to 160° . Side chain conformations also differ in the two phases. Two of the 16 molecules have side chains forming an 80° angle with the steroid long axis, a feature not previously encountered in cholesterol structures. Strong thermal motion is present in all side chains. A remarkable rotational pseudosymmetry relates eight of the sixteen independent molecules to the other eight, giving a pseudo-asymmetric unit of 8 molecules as contrasted with 4 in the RT phase.

03.4-03 CRYSTAL STRUCTURE OF THE 2:1 COMPLEX BETWEEN DEOXYCHOLIC ACID AND d-CAMPHOR. By J.G. Jones, S. Schwarzbaum, and L. Lessinger, Chemistry Dept., Barnard College, New York, USA

Bile is the source of several hydroxylated derivatives of the steroid 5α -cholan-24-oic acid which play important physiological roles in the digestion of fats and in excretion. One bile acid, deoxycholic acid (DCA), forms stoichiometric crystalline complexes with a wide variety of organic compounds. The complex 2:1 DCA:camphor crystallizes in space group $P2_12_12$ with $a=27.353$, $b=13.814$, $c=7.233$ Å, $D_m=1.137$, $D_x=1.139$ g/cm³ for $Z=4$ of $C_{24}H_{40}O_4 \cdot \frac{1}{2}(C_{10}H_{16}O)$.

The structure was solved by direct methods and refined to $R=0.07$. It consists of bilayers of DCA molecules, held together by hydrogen bonds between the two halves of the bilayer, and stacked with their hydrophobic surfaces in contact. The shape of the DCA steroid is such that between adjacent bilayers are formed channels, in which the camphor molecules stack. The channels are centered on crystallographic two-fold rotation axes; the roughly spherical camphor molecules are two-fold disordered.

The structure is compared to the several other known crystal structures of DCA with hydrophobic guest molecules. While DCA forms very similar bilayers in all these structures, there are some major and some subtle differences among them. The differences which allow for the formation of DCA complexes with molecules of such widely varying sizes and shapes as camphor, phenanthrene, cyclohexanone, acetic acid, and palmitic acid will be illustrated.

A1816-2142

REDACTED

NUMBERS NOT USED

A2143 – A2151

A2152-2188

REDACTED

NUMBERS NOT USED

A2189 – A2191

ANTONIO S.G. MIKOS

Curriculum Vitae

Education

Ph.D. (Ch.E.), Purdue University, 1988
M.S.Ch.E., Purdue University, 1985
Dipl.Ch.E., Aristotle University of Thessaloniki, Greece, 1983

Professional Experience

2008- Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering, Departments of Bioengineering and Chemical and Biomolecular Engineering, Rice University
1999-2008 John W. Cox Professor of Bioengineering and Chemical and Biomolecular Engineering, Departments of Bioengineering and Chemical and Biomolecular Engineering, Rice University
1999- Director of John W. Cox Laboratory for Biomedical Engineering, Rice University
1999- Director of Center for Excellence in Tissue Engineering, Rice University
2002- Adjunct Professor, Department of Oral and Maxillofacial Surgery, University of Texas Health Science Center at Houston
1996-1999 Associate Professor of Bioengineering and Chemical Engineering, Departments of Bioengineering and Chemical Engineering, Rice University
1998 Visiting Associate Professor of Pharmaceuticals and Pharmaceutical Chemistry, Center for Controlled Chemical Delivery, University of Utah
1998 Visiting Associate Professor of Biology and Pathology, Departments of Biology and Pathology, Case Western Reserve University
1992-1996 T.N. Law Assistant Professor of Chemical Engineering and Bioengineering, Department of Chemical Engineering, Rice University
1990-1991 Research Associate, Department of Chemical Engineering, Massachusetts Institute of Technology, and Department of Surgery, The Children's Hospital of Boston, Harvard Medical School
1989 Research Associate, Management of Chemistry Laboratories, Greek Navy
1988 Research Associate, Chemical Process Engineering Research Institute, Thessaloniki, Greece
1983-1988 Research Assistant, Purdue University
1982 (Sum.) Research Assistant, Center for Chemical Research, Bratislava, Czechoslovakia

Awards

2008 Outstanding Chemical Engineer Award, Purdue University
2008 Distinguished Scientist Award, Houston Society for Engineering in Medicine and Biology

11/10/08

2007 Alpha Chi Sigma Award for Chemical Engineering Research, American Institute of Chemical Engineers
 2007 Robert A. Pritzker Distinguished Lecturer Award, Biomedical Engineering Society
 2007 Edith and Peter O'Donnell Award in Engineering, The Academy of Medicine, Engineering and Science of Texas
 2007 Oral Abstract Scientific Presentation Award, Annual Meeting of the American Association of Oral and Maxillofacial Surgeons
 2005 Marshall R. Urist Award for Excellence in Tissue Regeneration Research, Orthopaedic Research Society
 2003 Huygens Lecturer Award, Netherlands Organization for Scientific Research
 2003 Innovation Award, Advanced Materials Research Center, Singapore
 2001 Clemson Award for Contributions to the Literature, Society For Biomaterials
 2000 Best Poster Award, Materials Research Society Fall Meeting
 2000 Phoenix Pharmazie-Wissenschaftspreis (Pharmaceutical Science Award)
 2000 Fellow, International Union of Societies for Biomaterials Science and Engineering
 2000 Hershel M. Rich Invention Award, Rice University
 1999 Fellow, American Institute for Medical and Biological Engineering
 1998 Young Investigator Research Achievement Award, Controlled Release Society
 1997 Hershel M. Rich Invention Award, Rice University
 1996 Outstanding Young Investigator Award, Materials Research Society
 1996 FIRST Award, National Institutes of Health
 1995 Hershel M. Rich Invention Award, Rice University
 1994 Whitaker Young Investigator Award, Biomedical Engineering Society
 1994 Johnson & Johnson Medical Outstanding Young Scientist Award, Houston Society for Engineering in Medicine and Biology
 1991 Victor K. LaMer Award for Outstanding Ph.D. Thesis, American Chemical Society
 1988, 1985 Sigma Xi Student Research Competition Award
 1983 Technical Chamber of Greece Award

Endowed/Honorary Lectureships

2008 Keynote Lecturer, International Conference on Research Strategy of Tissue Engineering, Jinan, China
 2008 Keynote Lecturer, Tenth International Symposium on Biomineralization, Lianyungang, China
 2008 Keynote Lecturer, Annual Symposium of Baylor College of Medicine Medical Scientist Training Program, Galveston, Texas
 2008 Keynote Lecturer, World Biomaterials Congress, Amsterdam, The Netherlands
 2008 Keynote Lecturer, Tenth Anniversary Celebration of Korean Tissue Engineering and Regenerative Medicine Society Meeting, Seoul, Korea
 2008 Robert A. Pritzker Distinguished Lecturer, Illinois Institute of Technology, Chicago, Illinois

11/10/08

2007 Keynote Lecturer, Annual Meeting of the Dutch Society for Biomaterials and Tissue Engineering, Lunteren, The Netherlands

2007 Centenary Seminar Series Lecturer, Imperial College, London, England

2007 James Gibb Johnson Distinguished Visiting Lecturer, University of Tennessee Health Science Center, Memphis, Tennessee

2007 Keynote Lecturer, Third Marie Curie Cutting Edge InVENTS Conference, Madeira, Portugal

2006 Keynote Lecturer, International Conference on Biomedical and Pharmaceutical Engineering, Singapore

2006 Keynote Lecturer, Annual Meeting of Japanese Society for Tissue Engineering, Kyoto, Japan

2006 Keynote Lecturer, Symposium on Nanomedicine and Tissue Engineering in Memory of Professor C.J. Lee, National Tsing Hua University, Hsinchu, Taiwan

2006 Koret Foundation Lecturer, University of California Davis, Sacramento, California

2006 Keynote Lecturer, First Marie Curie Cutting Edge InVENTS Conference, Madeira, Portugal

2006 Keynote Lecturer, Rebuilding Humans: The Seattle Tissue Engineering Initiative Symposium, Seattle, Washington

2005 Keynote Lecturer, Annual Meeting of Tissue Engineering Society International, Shanghai, China

2005 Keynote Lecturer, International Conference on Materials for Advanced Technologies, Singapore

2004 Procter and Gamble Lecturer, Iowa State University, Ames, Iowa

2004 Roger Malkin Distinguished Lecturer, Mississippi State University, Mississippi State, Mississippi

2003 Keynote Lecturer, First International Conference on Epithelial Technologies and Tissue Engineering, Singapore

2002 Keynote Lecturer, Annual Meeting of the Dutch Society for Biomaterials and Tissue Engineering, Lunteren, The Netherlands

2000 Keynote Lecturer, Research Council Meeting of Japan Society of Plastic and Reconstructive Surgery, Nagoya, Japan

2000 Keynote Lecturer, Annual Meeting of Japan Society of Drug Delivery System, Akita, Japan

1999 Distinguished Lecturer, University of Maryland, College Park, Maryland

1999 Keynote Lecturer, Academy of Dental Materials Annual Meeting, Tempe, Arizona

1998 Keynote Lecturer, Bionic Design Workshop, Tsukuba, Japan

1995 Keynote Lecturer, First International Congress on Cellular Therapy & Tissue Engineering, Washington, D.C.

Honors

2008 Chair, Third Aegean Conference on Tissue Engineering, Rhodes, Greece

2008 Invited Lecturer, A Celebration of Excellence in Scientific and Engineering Achievement on the Occasion of Nicholas Peppas' 60th Birthday, Austin, Texas

11/10/08

2008 Invited Lecturer, Conference on Regenerative Endodontics, Nova Southeastern University, Fort Lauderdale, Florida

2007 Invited Lecturer, Integrated Research Team Meeting on Nanotechnology Solutions for Long-Term Implantable Devices, Houston, Texas

2007 Invited Lecturer, International Bone Fluid Flow Workshop, New York, New York

2007 Invited Lecturer, Symposium on Musculoskeletal Biology, Stem Cells and Clinical Translation: A Celebration of Arnold Caplan's 65th Birthday, Cleveland, Ohio

2006 Invited Lecturer, International Collaborative Symposium on Stem Cell Research, Seoul, Korea

2006 Invited Lecturer, US-Japan Joint Topical Conference on Medical Engineering, Drug Delivery Systems and Therapeutic Systems, Annual AIChE Meeting, San Francisco, California

2006 Chair, Annual Meeting and Exposition of Controlled Release Society, Vienna, Austria

2006 Invited Lecturer, Conference Celebrating Thirty Years of Robert Langer's Science, Cambridge, Massachusetts

2006 Author of One of Twenty-Five Best Papers Published in Biomaterials 1980-2004

2006 Research Advisor of Sallyport Award, Association of Rice Alumni

2006 Research Advisor of Distinguished Senior Award, Rice Engineering Alumni Association

2006 Invited Lecturer, Regenerate World Congress on Tissue Engineering and Regenerative Medicine, Pittsburgh, Pennsylvania

2006 Invited Lecturer, Scientific Conference of Society for Physical Regulation in Biology and Medicine, Cancun, Mexico

2006 Invited Lecturer, International Cartilage Repair Society Symposium, San Diego, California

2005 Invited Lecturer, Pharmaceutical Sciences Symposium Honoring the Career of Professor Joseph R. Robinson, University of Wisconsin, Madison, Wisconsin

2005 Invited Lecturer, Texas/United Kingdom Symposium on Medicine and Medical Devices, Rice University

2005 Invited Lecturer, International Bone Fluid Flow Workshop, New York, New York

2005 Research Advisor of First Prize in Keck Center Annual Research Conference Poster Contest, Gulf Coast Consortia

2005 Invited Lecturer, Symposium on New Trends in Biomaterials-Tissue Engineering, National University of Singapore, Singapore

2005 Chair, Second Aegean Conference on Tissue Engineering, Crete, Greece

2005 Research Advisor of Graduate Student Award for Outstanding Research, Society For Biomaterials

2005 Invited Lecturer, Tissue Engineering: The Next Generation Workshop, Cambridge, Massachusetts

2005 Invited Lecturer, International Symposium on Recent Advances in Drug Delivery Systems, Salt Lake City, Utah

2004 Invited Lecturer, Fall Meeting of the Materials Research Society, Boston, Massachusetts

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2004 Invited Lecturer, Southeastern Regional Meeting of the American Chemical Society, Research Triangle Park, North Carolina

2004 Invited Lecturer, Annual Meeting of the American Institute of Chemical Engineers, Austin, Texas

2004 Research Advisor of Ralph Budd Award for Best Engineering Ph.D. Thesis, Rice University

2004 Research Advisor of James S. Waters Creativity Award, Rice University

2004 Invited Lecturer, First Biennial Symposium on Tissue Engineering and Regeneration, University of Michigan, Ann Arbor

2004 Invited Lecturer, European Symposium on Controlled Drug Delivery, Noordwijk aan Zee, The Netherlands

2004 Invited Lecturer, United Kingdom/Texas Symposium on Tissue Engineering and Regenerative Medicine, Imperial College, London, England

2004 Invited Lecturer, National American Chemical Society Meeting, Anaheim, California

2004 Invited Lecturer, Annual Meeting of the International Association for Dental Research, Honolulu, Hawaii

2003 Invited Lecturer, American Institute of Chemical Engineers Annual Meeting, San Francisco, California

2003 Invited Lecturer, Symposium Tissue Engineering, Netherlands Technology Foundation, Ede, The Netherlands

2003 Invited Lecturer, International Bone Fluid Flow Workshop, Cleveland, Ohio

2003-2007 Member, National Institute of Dental and Craniofacial Research Special Grants Review Committee

2003 Chairperson, Center for Scientific Review Special Emphasis Panel on Advanced Biomaterials, National Institutes of Health

2003 Invited Lecturer, Annual Meeting of Orthopaedic Research Society, New Orleans, Louisiana

2002 Invited Lecturer, Polymers in Medicine and Biology: 2002, Rohnert Park, California

2002 Chair, Engineering in Medicine and Biology Society - Biomedical Engineering Society Joint Conference, Houston, Texas

2002 Invited Lecturer, International Conference on Bone Morphogenetic Proteins, Sacramento, California

2002 Invited Lecturer, Smith & Nephew International Symposium on Translating Tissue Engineering into Products, Atlanta, Georgia

2002 Invited Lecturer, Annual Meeting of the Controlled Release Society, Seoul, Korea

2002 Chair, Aegean Conference on Tissue Engineering Science, Mykonos, Greece

2002 Research Advisor of Ralph Budd Award for Best Engineering Ph.D. Thesis, Rice University

2002 Research Advisor of Graduate Student Award for Outstanding Research, Society For Biomaterials

2002 Research Advisor of Tissue Engineering Special Interest Group Student Award, Society For Biomaterials

2002 Invited Lecturer, Edward C. Hinds Symposium on Contemporary Oral and Maxillofacial Surgery, Houston, Texas

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2002 Invited Lecturer, Annual Meeting of the Society For Biomaterials, Tampa, Florida

2002 Invited Lecturer, Annual Meeting of the American Association of Anatomists, New Orleans, Louisiana

2002 Invited Lecturer, Engineering Tissue Growth International Conference and Exposition, Pittsburgh, Pennsylvania

2002 Invited Lecturer, Biomaterials - The Next Frontiers Conference, University of Delaware, Newark, Delaware

2002 Invited Lecturer, Foundation for Research and Technology Hellas Conference, Metsovo, Greece

2002 Invited Lecturer, American Association of Pharmaceutical Scientists Workshop, Arlington, Virginia

2001 Invited Lecturer, Annual Conference on Regenerative Medicine: Rebuilding the Human Body, Washington, D.C.

2001 Invited Panelist, Bioengineering Consortium Symposium on Regenerative Medicine: Growing Tissues and Organs, National Institutes of Health

2001 Research Advisor of Best Poster Award, Baylor College of Medicine M.D./Ph.D. Symposium

2001 Research Advisor of James S. Waters Creativity Award, Rice University

2001 Invited Lecturer, Human Genome Odyssey Conference: The Science, Business, Law and Ethics of Engineering Human Life, Akron, Ohio

2001 Invited Lecturer, Engineering Tissue Growth International Conference and Exposition, Pittsburgh, Pennsylvania

2000 Chair, Materials Research Society Fall Meeting, Boston, Massachusetts

2000 Invited Lecturer, International Symposium on Tissue Engineering for Therapeutic Use, Tsukuba, Japan

2000 Research Advisor of Best Paper Award, Texas Medical Scientist Training Program Conference

2000 Invited Lecturer, Council for the Advancement of Science Writing Annual Briefing, Houston, Texas

2000 Invited Lecturer, Surfaces in Biomaterials, Scottsdale, Arizona

2000 Invited Lecturer, International Symposium on Biomaterials and Drug Delivery Systems, Cheju Island, Korea

2000 Research Advisor of Graduate/Postdoc Award on Innovative Aspects of Controlled Drug Release, Controlled Release Society-Capsugel

2000 Invited Lecturer, International Conference on Bone Morphogenetic Proteins, Lake Tahoe, California

2000 Invited Lecturer, Croucher Advanced Study Institute on Engineering of Musculoskeletal Tissues, Kowloon, Hong Kong

2000 Invited Lecturer, European Symposium on Controlled Drug Delivery, Noordwijk aan Zee, The Netherlands

2000 Invited Lecturer, Translation of Biomaterials Research into Biotechnology Symposium, University of Chicago, Chicago, Illinois

2000 Invited Lecturer, Annual Meeting of Orthopaedic Research Society and American Academy of Orthopaedic Surgeons, Orlando, Florida

2000 Alessandro Codivilla Lecturer, Association for the Study and Application of the Methods of Ilizarov Annual Scientific Meeting, Orlando, Florida

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2000 Invited Lecturer, Research Initiatives Conference in Vascular Disease, Bethesda, Maryland

1999 Invited Lecturer, BioValley Tissue Engineering Symposium, Freiburg, Germany

1999 Invited Lecturer, Asia-Pacific Conference on Medical and Biological Engineering, Seoul, Korea

1999 Invited Lecturer, Gordon Research Conference on Tissue Engineering, Biomaterials, and Biocompatibility, Plymouth, New Hampshire

1999 Member, Biomimetics and Tissue Engineering in the Restoration of Orofacial Tissues Study Section, National Institutes of Health

1999 Invited Lecturer, Congress on In Vitro Biology, New Orleans, Louisiana

1999 Member, Dental, Oral and Craniofacial Health Technology Forum, National Institute of Dental and Craniofacial Research/Food and Drug Administration

1999 Invited Lecturer, International Workshop on Calcified Tissues, Eilat, Israel

1998 Research Advisor of Graduate Student Award for Outstanding Research, Society For Biomaterials

1998 Research Advisor of Excellence in Science Dissertation Award for Best Ph.D. Thesis, Sigma Xi

1998 Research Advisor of Graduate Student Award for Best Paper, Southern Biomedical Engineering Conference

1998 Member, Functional Biomaterials Panel, Bioengineering Consortium Symposium, National Institutes of Health

1998 Invited Lecturer, Association of Bone and Joint Surgeons Orthopaedic Tissue Engineering Workshop, Tampa, Florida

1998 Invited Lecturer, International Business Communications Industry Symposium on Advancements in Tissue Engineering, Boston, Massachusetts

1997-2000 Ad Hoc Member, Oral Biology and Medicine Study Section, National Institutes of Health

1997 Invited Lecturer, Workshop on Tissue Based Biosensors, Defense Advanced Research Projects Agency, Ashburn, Virginia

1997 Invited Lecturer, Annual Symposium of Macromolecular Science and Engineering Center, The University of Michigan, Ann Arbor, Michigan

1997 Invited Lecturer, Medical Textiles Conference, Clemson University, Clemson, South Carolina

1997 Invited Lecturer, Portland Bone Symposium, Portland, Oregon

1997 Invited Lecturer, First Smith & Nephew International Symposium on Advances in Tissue Engineering and Biomaterials, York, England

1997 Research Advisor of Graduate Student Award for Outstanding Research, Society For Biomaterials

1997 Research Advisor of Selected Excellence Paper, Society For Biomaterials

1997 Research Advisor of Ralph Budd Award for Best Engineering Ph.D. Thesis, Rice University

1997 Research Advisor of Ph.D. Thesis Award, Sigma Xi

1997 Research Advisor of James S. Waters Creativity Award, Rice University

1997 Invited Lecturer, International Symposium on Recent Advances in Drug Delivery Systems, Salt Lake City, Utah

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- 1997 Research Advisor of Poster Award, Houston Society for Engineering in Medicine and Biology
- 1996-1998 Member, Clinical Sciences Special Emphasis Panel, Muscular, Skeletal, and Dental Initial Review Group, National Institutes of Health
- 1996 Research Advisor of Excellence in Bioengineering, Dr. William B. Walsh Award, Advanced Tissue Sciences
- 1996 Research Advisor of James S. Waters Creativity Award, Rice University
- 1996 Research Advisor of Honorable Mention, Poster Award, Houston Society for Engineering in Medicine and Biology
- 1996 Member, Workshop on Biomimetics, Tissue Engineering, and Biomaterials, National Institute of Dental Research
- 1996 Invited Lecturer, International Symposium on Endocrine Cell Transplantation and Genetic Engineering, Giessen, Germany
- 1995 Invited Lecturer, Taniguchi Conference on the Tissue Engineering with the Use of Biomedical Polymers, Kyoto, Japan
- 1995 Invited Lecturer, International Business Communications Conference on Tissue Engineering and Repair, Washington, D.C.
- 1995 Research Advisor of Distinguished Contribution, BFGoodrich Collegiate Inventors Program
- 1995 Research Advisor of Best Undergraduate Polymer Research, POLYED Award, American Chemical Society
- 1995 Founding Member, Tissue Engineering Society
- 1995 Invited Lecturer, American Society for Artificial Internal Organs Conference, Chicago, Illinois
- 1995 Ad Hoc Member, Biomedical Research Technology Review Committee, National Institutes of Health
- 1995 Invited Lecturer, American Association for the Advancement of Science Meeting, Atlanta, Georgia
- 1995 Research Advisor of Best Poster, Intermedics Award, Houston Society for Engineering in Medicine and Biology
- 1994 Invited Lecturer, Surfaces in Biomaterials, Scottsdale, Arizona
- 1994 Invited Lecturer, World Congress of Biomechanics, Amsterdam, The Netherlands
- 1994 Invited Lecturer, International ITV Conference on Biomaterials, Denkendorf, Germany
- 1993 Research Advisor of Best Undergraduate Polymer Research, POLYED Award, American Chemical Society
- 1993 Research Advisor of James S. Waters Creativity Award, Rice University
- 1993 Invited Lecturer, Monte Verità Conference, Ascona, Switzerland
- 1992 Invited Lecturer, Jerusalem Conference on Pharmaceutical Sciences and Clinical Pharmacology, Jerusalem, Israel
- 1992 Invited Lecturer, Hispanic and Hispanic-Portuguese Congress on Biotechnology, Santiago de Compostela, Spain

Editorial Boards

Tissue Engineering Part A (1995-), Editor-in-Chief (1995-)

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Tissue Engineering Part B: Reviews (2008-), Editor-in-Chief (2008-)
 Tissue Engineering Part C: Methods (2008-), Editor-in-Chief (2008-)
 Advanced Drug Delivery Reviews (2004-)
 Biomaterials (1994-), Special Issues Editor (1998-2007), Guest Editor of Two Special Issues on
 Tissue Engineering (1996)
 Cell Transplantation (1994-)
 Electronic Journal of Biotechnology (1997-)
 Journal of Biomaterials Science, Polymer Edition (1996-), Guest Editor of Three Special Issues
 on Cells at Interfaces (1998)
 Journal of Biomedical Materials Research (1996-)
 Journal of Biomedical Materials Research, Applied Biomaterials (2003-)
 Journal of Controlled Release (2000-)
 Journal of Drug Targeting (1999-2003)
 Journal of Tissue Engineering and Regenerative Medicine (2007-)
 Annual Review of Biomedical Engineering, Volume 5 (2003)
 Tissue Engineering Intelligence Unit, R.G. Landes Company and Academic Press (1995-)
 Tissue Engineering Series, Birkhäuser/Springer (1996-)

Academic Advisory Boards

Carnegie Mellon University, Institute for Complex Engineered Systems (2008-)
 Radboud University Nijmegen, Nijmegen Centre for Molecular Life Sciences (2005)
 The Cleveland Clinic Foundation, Clinical Tissue Engineering Center (2004-)
 National Tissue Engineering Center (2003-)
 University of Michigan, Tissue Engineering and Regeneration Training Program (2002-)
 University of Utah, Department of Bioengineering (1999)
 Purdue University, Tissue Engineering (1998-2002)
 Baylor College of Medicine/Rice University, Medical Scientist Training Program
 Faculty Operating Committee Member (1995-)
 Executive Committee Member (2006-)
 The University of Texas Health Science Center at Houston, Dental Branch (1993-)

Scientific Advisory Committees

International Conference on Materials for Advanced Technologies, Singapore (2009)
 Annual Conference of Tissue Engineering and Regenerative Medicine International Society –
 Asia Pacific Region, Taipei, Taiwan (2008)
 International Conference on Smart Materials, Structures and Systems, Acireale, Sicily, Italy
 (2008)
 International Conference on Advances in Bioresorbable Biomaterials for Tissue Engineering,
 Singapore (2008)
 European Symposium on Controlled Drug Delivery, Noordwijk Aan Zee, The Netherlands
 (2006-)
 First Marie Curie Cutting Edge InVENTS Conference on New Developments on Polymers for
 Tissue Engineering, Replacement and Regeneration, Madeira, Portugal (2006)
 Annual Meeting of Society For Biomaterials, Pittsburgh, Pennsylvania (2006)

11/10/08

Aegean Conferences (2005-)
 Annual Meeting of Tissue Engineering Society International, Shanghai, China (2005)
 Summer School on Emerging Technologies in Biomedicine, University of Patras, Greece (2005-)
 Marcus Evans Conferences (2003-)
 International Conference on Materials for Advanced Technologies, Singapore (2003)
 Engineering Tissue Growth International Conference and Exposition, Pittsburgh, Pennsylvania (2003)
 Cell-Based Therapies and Tissue Engineering Short Course, Case Western Reserve University, Cleveland, Ohio (2002-)
 NATO Advanced Study Institute on Polymer Based Systems on Tissue Engineering, Replacement and Regeneration, Alvor, Portugal (2001)
 International Symposium on Frontiers in Biomedical Polymers Including Polymer Therapeutics, Shiga, Japan (1999)

Professional Societies

American Institute for Medical and Biological Engineering (AIMBE)
 American Institute of Chemical Engineers (AIChE)
 Chair of Area 15d/e Engineering Fundamentals in Life Science (1997-99), Vice Chair (1995-97); Chair of Area 8b Biomaterials (1994-96), Vice-Chair (1992-94)
 Association for Research in Vision and Ophthalmology (ARVO)
 Society For Biomaterials (SFB)
 Chair of Hybrid Artificial Organs Special Interest Group (1993-95); Member-at-Large (2004-2005); Delegate in International Union of Societies for Biomaterials Science and Engineering (2004-); Secretary/Treasurer-Elect (2007-)
 Biomedical Engineering Society (BMES)
 Controlled Release Society (CRS)
 Global Network Team (1994-96); Chair of Workshop Committee (1996-98)
 Materials Research Society (MRS)
 External Affairs Committee (1995-2003); Chair of 2000 Fall MRS Meeting
 Tissue Engineering and Regenerative Medicine International Society (TERMIS)
 Continental Chair-Elect of TERMIS-North America (2005-)
 Tissue Engineering Society International (TESI)
 Founding Member; Clerk/Secretary (1996-1998); Vice-President (1998-2000); Member Governor (2003-2005)
 Orthopaedic Research Society
 Chair of Biomaterials Topic Committee (2005-2006)
 International Association for Dental Research (IADR)
 Cell Transplant Society
 American Chemical Society (ACS)
 American Association for the Advancement of Science (AAAS)
 The New York Academy of Sciences
 Houston Society for Engineering in Medicine and Biology (HSEMB)
 Steering Committee (1995-97)
 Technical Chamber of Greece
 Greek Chemical Engineers Association

11/10/08

Greek Polymer Society
Sigma Xi

Registered Professional Engineer

Technical Chamber of Greece (1983-)

Books

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5. C.W. Patrick, Jr., A.G. Mikos, and L.V. McIntire, "Frontiers in Tissue Engineering," Elsevier Science, New York, 1998.
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7. A.G. Mikos, "NWO | Huygens Lecture 2003: Tissue Engineering," Netherlands Organization for Scientific Research, The Hague, 2003.
8. F. Bronner, M.C. Farach-Carson, and A.G. Mikos, "Engineering of Functional Skeletal Tissues," Topics in Bone Biology, Vol. 3, Springer-Verlag, London, 2007.
9. J.P. Fisher, A.G. Mikos, and J.D. Bronzino, "Tissue Engineering," CRC Press, Boca Raton, 2007.
10. J.J. Mao, G. Vunjak-Novakovic, A.G. Mikos, and A. Atala, "Translational Approaches in Tissue Engineering and Regenerative Medicine," Artech House, Norwood, 2008.
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3. T.A. Horbett, A.G. Mikos, and D.J. Mooney, J. Biomater. Sci., Polym. Ed., Special Issue I on Cells at Interfaces, Vol. 9, No. 8, 1998.

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6. T.A. Horbett, A.G. Mikos, and D.J. Mooney, *J. Biomater. Sci., Polym. Ed., Special Issue IV on Cells at Interfaces*, Vol. 10, No. 2, 1999.
7. A.G. Mikos, "Section Five: Active Implants" (Four Chapters), in *Handbook of Biomaterials Evaluation*, 2nd ed., A.F. von Recum, Ed., Taylor & Francis, Philadelphia, 1999, pp. 383-460.
8. Y.H. Bae and A.G. Mikos, *Adv. Drug Deliv. Rev., Special Issue on Cells as Drug Delivery Platforms*, Vol. 42, Nos. 1-2, 2000.
9. D.J. Mooney and A.G. Mikos, *J. Drug Target., Special Issue on Tissue Engineering*, Vol. 9, No. 6, 2001.
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